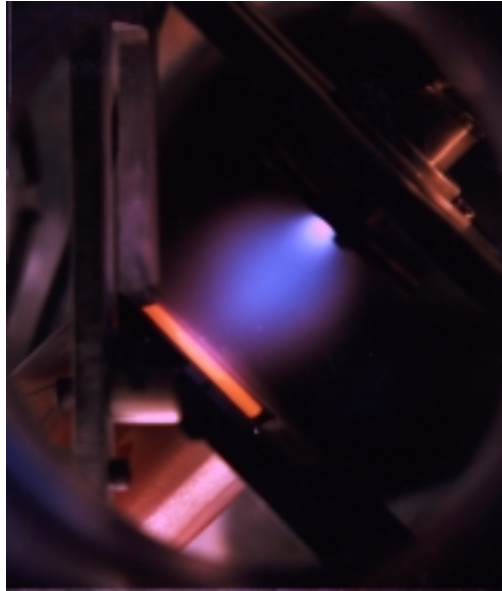


PULSED LASER DEPOSITION OF BIOCOMPATIBLE CERAMICS



Pulsed Laser Deposition (PLD) is a new technique for the deposition of thin films of biocompatible ceramics. Pulsed Laser Deposition is especially well-suited to the deposition of bone-like ceramics (e.g., hydroxylapatite, calcium phosphates) onto metal, ceramic, semiconductor or polymer substrates for potential application in medical implants, prosthetic devices and biocompatible probes or sensor.

Advantages of PLD for the deposition of biocompatible ceramics include the following:

- PLD is capable of depositing hydroxylapatite (HA) in situ in crystalline form, uncontaminated by other calciumphosphate phases.
- Simple adjustment of PLD parameters allows the deposition of amorphous films or other calcium phosphate phases, if desired.
- PLD can be conducted in both reactive and non-reactive gaseous environments, allowing control of the chemical composition of the films.
- The deposition parameters can be varied in situ to produce films of graded composition, phase, density of micro structure in order to optimize bioreactivity and resorbability.
- Adhesion of PLD-HA films exceeds the yield strength of the substrates for substrates comprising material typically used for prosthetics (e.g., Ti-6Al-4V).

The degree of control over film characteristics offered by PLD exceeds that of other known deposition techniques presently applied to production of thin films of biocompatible ceramics. It is anticipated that PLD will develop into the technique of choice for the manufacture of implant or prosthetic devices comprising biocompatible films on structurally robust substrates.

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